

## Curriculum Vitae

### Steffen Mueller

Senior Economist,  
Research Assistant Professor  
Energy Resources Center  
University of Illinois at Chicago

Senior Partner,  
Life Cycle Associates  
[www.lifecycleassociates.com](http://www.lifecycleassociates.com)

### Educational Background

#### Ph.D.

May 2004, Public Policy Analysis  
University of Illinois at Chicago, Chicago, Illinois.  
Dissertation title: *Missing the Spark: An Investigation into the Energy Paradox for Combined Heat and Power Technologies*

#### Master of Business Administration

May 1995, Finance and Marketing, Keller Graduate School of Management, Chicago, Illinois.

#### Bachelor of Science

October 1991, Environmental Engineering, Technical Academy Karlsruhe, Germany.

#### Certificate

May 1998, Financial Markets and Energy Trading, Illinois Institute of Technology, Chicago, Illinois.

### Relevant Teaching Qualifications

Illinois College Teaching Certificate

### Teaching Experience

- Graduate Course ME494, Fall 2004-2006: Distributed Generation and Onsite Power Generation.
- City of Chicago, Green Tech University: Architect and Engineers Green Building Certification Program, Guest Lecturer, 2005-2006.
- Honors College HON105: Introduction to Environmental Science, Guest Lecturer, 2004.

### Other

- Proficiency in GREET 1.7 and Crystal Ball
- Languages: German, English, and some French
- German national, US permanent resident

## Professional Experience

2001-present

**Senior Economist**, Energy Resources Center, University of Illinois at Chicago

**Senior Partner**, Life Cycle Associates, Sunnyvale, California

**Research Assistant Professor**, Department of Mechanical and Industrial Engineering, University of Illinois at Chicago (2006-present)

**Research Fellow**, Institute for Environmental Science and Policy, University of Illinois at Chicago (2003-2004)

### Recent Studies:

#### THE USE OF WOOD BIOMASS FOR DISTRIBUTED ENERGY GENERATION IN IOWA; A MODELING APPROACH BASED ON THE ENERGY DEMANDS OF ETHANOL ENERGY SYSTEMS

The study utilizes biomass supply curves and GIS software to determine regions in Iowa where distributed energy systems fueled by waste wood are feasible. The study looks at biomass combustion and gasification systems. The study was funded by the Iowa Department of Natural Resources.

#### “RESEARCH INVESTIGATION FOR THE POTENTIAL USE OF COMBINED HEAT AND POWER AT NATURAL GAS AND COAL FIRED DRY MILL ETHANOL PLANTS”

The payback of combined heat and power systems differs based on the region and the fuel feedstocks. The study assesses the expected payback periods for coal and natural gas fired chp systems installed at corn ethanol plants across eight Midwestern states. The study was funded by the US Department of Energy.

#### Two Part Study:

1) “AN ANALYSIS OF THE PROJECTED GLOBAL WARMING IMPACT OF CORN ETHANOL PRODUCTION (YEARS 2010-2030)”

and

2) “AN ANALYSIS OF THE PROJECTED ENERGY USE OF FUTURE DRY MILL CORN ETHANOL PLANTS (2010-2030)”

Improvements to the energy systems at biorefineries as well as improvements to current agricultural practices will further reduce the global warming intensity (GWI) of corn ethanol. Using Argonne’s GREET and Life Cycle Associates’ BEACCON model, the study quantifies the expected GWI reductions for ethanol during the years 2015 through 2030. The study was funded by the Illinois Corn Marketing Board.

#### “RESEARCH INVESTIGATION FOR THE POTENTIAL USE OF ILLINOIS COAL IN DRY MILL ETHANOL PLANTS”

The study identifies the differences between a standardized coal fired ethanol plant to a standardized natural gas fired ethanol plant with respect to the different equipment types, the energy flows, the capital and O&M costs, the

permitting considerations, and the life-cycle aspects. The study was funded by the Illinois Clean Coal Institute.

**“ENVIRONMENTAL IMPACT FROM SUSTAINABLE ENERGY PROVISION IN THE MIDWEST UTILIZING ECONOMIC DISPATCH ANALYSIS”**

The study quantifies the decrease of criteria pollutants and carbon dioxide from implementing a renewable portfolio standard in Illinois. The project was funded by Shaw, E&I Inc.

**“ENERGY, ECONOMIC AND ENVIRONMENTAL IMPACTS OF RENEWABLE AND ENERGY EFFICIENCY DEPLOYMENT IN ILLINOIS”**

The project was funded by the Illinois Department of Commerce and Economic Opportunity in support of the emerging renewable portfolio standard in the state. As the principal author of the renewable energy generation section, I performed economic analyses on the capacity potential, the cost, and the deployment potential of renewable electricity generating technologies.

**“ENVIRONMENTAL PERMITTING GUIDEBOOK FOR DISTRIBUTED GENERATION AND COMBINED HEAT AND POWER APPLICATIONS”**

I authored this booklet to provide an overview of the air emissions, water discharge, and other regulatory requirements associated with the installation of distributed generating projects. The project was funded by the US Department of Energy and the Illinois Department of Commerce and Economic Opportunity.

Other Recent Activities:

- Currently developing the BEACCON model, a spreadsheet based model that assesses the connection between production cost and global warming impact of distributed energy systems. The model also utilizes, in modified form, the GREET 1.7 lifecycle methodology. Version 1.0 of the BEACCON model can be downloaded at [www.lifecycleassociats.com](http://www.lifecycleassociats.com).
- Currently managing a grant program for the Illinois Department of Commerce and Economic Opportunity titled “Renewable Energy Resources – Biogas and Biomass to Energy Grant Program.” The program provides financial assistance for engineering studies and installations of renewable energy systems at livestock operations and waste water treatment facilities.
- Currently conducting several studies on the global warming intensity of corn ethanol plants.
- Technical support contractor to the US Department of Energy’s Vision2020 Innovative Energy Systems Challenge program. The intent of this effort is to stimulate high-risk energy efficiency R&D projects in the chemicals process industry. Drafted the Request for Proposal document and served on the Merit Review panel to select the winning proposal.

- Technical support contractor to the US Department of Energy's Save Energy Now program. Currently preparing "Custom Generated Technology Briefings" for the energy savings audit program. To date, 104 Technology Briefings have been generated.
- Organized and presented at workshops promoting the use of combined heat and power applications at ethanol plants.
- Conducted feasibility studies assessing the technical and economic viability of distributed generation projects at industrial and commercial facilities.
- Organized workshops with representatives from all Midwestern utility regulatory commissions on interconnection standards and standby-rate design for distributed electric generating facilities.
- Prepared distributed generation case study protocol. The project was funded by the Association of State Energy Research and Technology Transfer Institutions (ASERTTI) under the Collaborative National Program for the Development and Performance Testing of Distributed Power Technologies. Major sponsors of this ASERTTI effort include the California Energy Commission, the Illinois Department of Commerce and Economic Opportunity, the New York State Energy Research and Development Authority, and the US Department of Energy.

1997-2001

**Manager, Business Development**, SkyGen Energy / Calpine Corporation, Northbrook, Illinois

- Developed bid proposals for natural gas fired cogeneration and peaking power plants serving several utilities including co-development on a winning proposal that resulted in the construction of a 500 MW natural gas fired combustion turbine plant in the Midwest USA.
- Selected sites and executed site option and purchase agreements with land-owners for new power generation facilities in the United States. Worked closely with electric utility companies, local economic development departments, elected community officials, and the zoning and planning departments to support new projects.
- Structured and negotiated power purchase and electric interconnection agreements with several utilities, electric cooperatives and power marketers. Negotiated and executed a 75 MW, 10 year power purchase agreement with a Midwestern utility.
- Performed electricity supply and demand analyses (based on US Energy Information Administration load duration data files) to identify the need and dispatch patterns of new electricity capacity additions across various regions and states. Authorized and directed electricity/natural gas market studies conducted by ICF Kaiser International, C.C. Pace

Consulting, R.W. Beck, Jaakko Pöyry Consulting, and Navigant Consulting.

- Principal financial analyst for the financing of a 150 MW merchant cogeneration plant in New England, resulting in financial closing of the project in June 1998.

1992-1997

**Engineer**, Research and Development Department, Landauer Inc., Glenwood, Illinois

- Assisted in the development of a technology transfer program between a German Federal Research Center and Landauer Inc.
- Modified Landauer's environmental monitoring devices (radiation dosimeters) for the measurement of radiation to conform to German code and standards.
- Provided consulting and customer support regarding radiation monitoring programs to nuclear power plants, Department of Energy Facilities, universities and hospitals.

1988-1991

**Student Engineer**, Radioactive Waste Treatment Facility, University Hospital of Heidelberg, Germany

- Calibrated the waste treatment facility's radiation dosimetry equipment. Monitored radiation level of radioactive waste.

1990

**Student Engineer**, Neutron Research Reactor Site, Institut Laue- Langevin, Grenoble, France

- Assisted in the routine radiation dosimetry programs at the institute.

#### Magazine Articles

- "Global Warming Intensity of Ethanol - Determining Climate Benefits"; BioCycle Magazine, January 2008, together with Richard Plevin.
- "Producing Ethanol for Low-Carbon Fuel Markets"; Ethanol Producer Magazine, May 2007, together with Richard Plevin.

#### Reviewed Journal Publications

- "Manure's Allure: Variation of the Financial, Environmental, and Economic Benefits from Combined Heat and Power Systems Integrated with Anaerobic Digesters at Hog Farms across Geographic and Economic Regions"; Renewable

Energy , Volume 32, Issue 2 , February 2007, pp. 248-256.

- “Missing the Spark: An Investigation into the Low Adoption Paradox of Combined Heat and Power Technologies”; Energy Policy, Volume 34, Issue 17, November 2006, pp. 3153-3164.
- “Prioritizing Regulatory Barriers To Combined Heat and Power Adoption Using Selected Case Studies”; Cogeneration and Distributed Generation Journal; Volume 20, NO. 4, Fall 2005.

#### Principal Conference Organizer

- Illinois River Energy Ethanol Plant, Rochelle, Illinois, February 4, 2008.  
Conference Title: “Midwestern Ethanol and California’s Low Carbon Fuel Standard.”
- National Corn to Ethanol Research Center (NCERC), Edwardsville, Illinois, May 10, 2007. Conference Title: “The Impact of Low Carbon Fuel Standards for Illinois and other Midwestern Ethanol Plants”; Workshop Sponsors: Illinois Department of Commerce, NCERC.
- Bloomington, Illinois and Sterling, Illinois, August 30, 2006 and August 31, 2006:  
Conference Title: “Methane Production and Power Generation from Livestock Manure”; Workshop Sponsors: US Department of Energy, US Department of Agriculture, Illinois Farm Bureau, and others.
- Detroit, Michigan, June 8, 2005:  
Conference Title: “Effect of Distributed Generation Regulations on State Jobs and Consumer Benefits”; Workshop Sponsors: NextEnergy, US Department of Energy.
- Sioux City, Iowa, and Cedar Rapids, Iowa, November 2004:  
Workshop Title: “Methane Recovery from Hog Waste Integrated With Combined Heat and Power Technologies: A Waste-to-Energy Workshop for Iowa’s Swine Industry”; Workshop Sponsors: Iowa Department of Natural Resources, Iowa Agriculture Innovation Center, Iowa Energy Center, Iowa Pork Producers Association, Iowa Farm Bureau, Alliant Energy, US Department of Energy, and others.
- Des Moines, Iowa, April 1, 2004:  
Workshop Title: “Combined Heat and Power and Ethanol Plants – A Workshop for the Iowa Ethanol Industry”; Workshop Sponsors: Iowa Department of Natural Resources, Iowa Renewable Fuels Association, Iowa Agriculture Innovation Center, US Department of Energy, US Environmental Protection Agency, Iowa Farm Bureau Federation.
- St. Paul, Minnesota, May 14, 2003:  
Workshop Title: “Distributed Generation Tariff Workshop for Public

Utility Regulators”; Workshop Sponsors: US Department of Energy, Midwest CHP Application Center, Minnesota Department of Commerce.

- Chicago, Illinois, February 12, 2002:  
Workshop Title: “Distributed Generation Interconnection Workshop for Public Utility Regulators”; Workshop Sponsors: US Department of Energy, Midwest CHP Application Center.

### Key Presentations

- Rochelle, IL, February 4, 2008  
Presented at: “Midwestern Ethanol and California’s Low Carbon Fuel Standard” Workshop.  
Presentation Title: “The Global Warming Impact of Future Corn Ethanol (2010-2030)”
- Lansing, MI, January 16, 2008  
Presented at: “Michigan Rebuild America Webinar”  
Presentation Title: “Understanding and Modeling the Carbon Footprint for Michigan Facilities”
- Washington, DC, October 31, 2007  
Presented at: “Illinois Corn Marketing Board Winter Lobbying Trip to Washington”  
Presented to: United States Department of Agriculture, United States Department of Energy, 4 Congressional Offices, Environmental and Energy Study Institute  
Presentation Title: “The Global Warming Impact of Future Corn Ethanol (2010-2030)”
- Oak Brook, IL, October 24, 2007  
Presented at: “The Annual Energy Conference of the Midwest Cogeneration Association”  
Presentation Title: “Assessing the Climate Change Impact of Biofuels”
- Indianapolis, IN, October 2, 2007  
Presented at: “The 7th Annual BioCycle Conference On Renewable Energy From Organics Recycling”  
Presentation Title: “Assessing the Climate Change Impact of Biofuels”
- Chicago, IL, September 26, 2007  
Presented at: “The American Institute of Chemical Engineers (AIChE) Symposium”  
Presentation Title: “The Spark of Biofuels”
- Edwardsville, Illinois, May 10, 2007. Presentation at “The Impact of Low Carbon Fuel Standards for Illinois and other Midwestern Ethanol Plants” Roundtable Meeting. The event was held at the National Corn to Ethanol Research Center and it was attended by more than 30 ethanol producers and state regulators.  
Presentation Title: “Carbon Content Variations of Ethanol”

- Urbana-Champaign, Illinois, April 26-27, 2007. Presentation at the “Fueling Change with Renewable Energy – International Symposium”;  
Presentation Title: “Renewable Energy in Illinois. A Solid Foundation – Time to Build.”
- Des Moines, Iowa, May 10, 2006 and Minneapolis, Minnesota, March 30, 2006:  
Presentation at the “Annual Conference of Municipal Utility Companies”;  
Presentation Title: “The Benefits of Distributed Generation to Public Power Companies.”
- Chicago, Illinois, November 17, 2005, May 25, 2006, February 6, 2007:  
Presentation at the “Chicago Green Technology University”;  
Presentation Title: “Integrating Combined Heat and Power Systems into Green Building Design and Certification.”
- Detroit, Michigan, June 8, 2005:  
Presentation at the “Effect of CHP Regulations on State Jobs and Consumer Benefits Workshop”;  
Presentation Title: “Economic, Employment and Environmental Impacts of Increased Distributed Generation Investment in Illinois.”
- Sioux City, Iowa, November 3, 2004 and Cedar Rapids, Iowa, November 4, 2004:  
Presentation at the “Methane Recovery from Hog Waste Integrated with CHP Workshop”;  
Presentation Title: “Combined Heat and Power Integrated with Anaerobic Digesters: The Business Case.”
- Los Angeles, California, March 25, 2004:  
Presentation at the “Stakeholder Advisory Committee Meeting” organized by ASERTTI (Association of State Energy Research and Technology Transfer Institutions) as part of the “Collaborative National Program for the Development of Performance Testing and Reporting Protocols of Distributed Power Technologies”;  
Presentation Title: “Overview of Distributed Generation / Combined Heat and Power Case Study Protocols.”

### Professional Activities

- Review of Research Proposals, US Department of Energy, Vision 2020 Innovative Energy Systems Challenge for the Chemicals Industry, Denver, Colorado (2006)
- Review of Research Proposals, Fellowship Applicants, National Science Foundation Environmental Management and Manufacturing Program, Chicago, Illinois (2004)
- Review of Research Proposals, Power Systems, New York State Energy Research and Development Authority (NYSERDA), Buffalo, New York (2004)

- Research Fellow, Environmental Manufacturing Management Program at the Institute for Environmental Science and Policy, University of Illinois at Chicago (2002-2003)
- Participant, German-American Work-Study Program, Carl Duisberg Society, New York (1992)